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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/802,015	03/16/2004	Shahla Khorram	BP3114	2742

34399 7590 07/13/2005

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EXAMINER	
TAKAOKA, DEAN O	

ART UNIT	PAPER NUMBER
2817	

DATE MAILED: 07/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/802,015	KHORRAM ET AL.
	Examiner	Art Unit
	Dean O. Takaoka	2817

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Dabrowski (U.S. Patent No. 5,644,272).

Claim 1:

Dabrowski (Fig. 3) shows a tuned transformer balun circuit comprising a transformer balun having a single ended winding (S1) and a differential winding (S2), where the single-ended winding includes a first node (42) and a second node (40) and the differential winding includes a first node (44), center node (38) and a second node (46); a first tuning capacitor (C3) having a first plate and a second plate (inherent, where the capacitor is inherently defined by opposing plates and where the plates are shown by the equivalent capacitor circuit representation), where the first plate of the first tuning capacitor is operably coupled to the first node of the differential winding (connected to 44 thru 48 and S3) and the second plate is operably coupled to ground (thru unlabeled via and analogous to C5 ground connection); a second tuning capacitor (C4) having a

first plate and a second plate, where the first plate of the tuning capacitor is operably coupled to the second node of the differential winding (connected to 46 thru 50 and S5) and the second plate is operably coupled to ground (thru unlabeled via and analogous to C5 ground connection); and a third tuning capacitor (C1) having a first plate and a second plate, where the first plate of the third tuning capacitor is operably coupled to the first node of the single-ended winding (42) and the second plate is operably coupled to transceiver radio frequency signals (at node 30 where node 30 comprises the input for RF signals; col. 1, lines 8-55), where based on loading of the single-ended winding and the differential winding, the first second and third tuning capacitors resonate with the transformer balun (shown in tables 1 and 2 where the values of the capacitors show the operable frequencies).

Claim 5:

Where the first, second and third capacitors have a capacitance in the range of tens of picofarads (table 2).

Claims 1 – 4 and 6 – 9 are rejected under 35 U.S.C. 102(e) as being anticipated by Rofougaran et al. (US Patent No. 6,809,581)

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in

the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Claim 1:

Rofougaran et al. (Figs. 3-5) shows a tuned transformer balun circuit comprising a transformer balun having a single ended winding (pri) and a differential winding (sec), where the single-ended winding includes a first node (connected to 106) and a second node (connected to ground – Fig. 5) and the differential winding (sec) includes a first node (connected to C1), center node (connected to tap) and a second node (connected to C2 – Fig. 5); a first tuning capacitor (C1) having a first plate and a second plate (inherent, where the capacitor is inherently defined by opposing plates and where the plates are shown by the equivalent capacitor circuit representation), where the first plate of the first tuning capacitor is operably coupled to the first node of the differential winding and the second plate is operably coupled to ground (thru FET T3 and L3 connected to ground); a second tuning capacitor (C2) having a first plate and a second plate, where the first plate of the tuning capacitor is operably coupled to the second node of the differential winding and the second plate is operably coupled to ground (thru FET T4 and L4 connected to ground); and a third tuning capacitor (C3 – Fig. 4) having a first plate and a second plate, where the first plate of the third tuning capacitor is operably coupled to the first node of the single-ended winding (pri) and the second plate is operably coupled to transceiver radio frequency signals (108), where based on loading of the single-ended winding and the differential winding, the first second and

third tuning capacitors resonate with the transformer balun (where C1 and C2 block low frequency – col. 6, lines 36-39 and C3 is tuned – col. 6, line 67).

Claim 2:

A decoupling capacitor (C5) having a first plate and second plate, where the first plate of the decoupling capacitor is operably coupled to the second node of the single-ended winding and to the center node of the differential winding (shown in Fig. 4 where C5 connects to the end of the pri winding opposite the input and to the tap of the sec winding) and the second plate of the decoupling capacitor is operably coupled to circuit ground (thru L and R to ground) to provide low impedance AC ground connection over a range of frequencies (col. 7, lines 19-29).

Claim 3:

The transformer balun residing on at least one layer of an integrated circuit (on chip balun – col. 2, lines 8-43), where the second node of the single-ended winding is operably coupled to an integrated circuit pin via a bond wire (120; col. 7, lines 19-29) and where the integrated circuit pin is coupled to an antenna (108), where the bond wire and antenna provide the loading of the single-ended winding.

Claim 4:

The first node of the differential winding operably coupled to a first output transistor (T3) of a power amplifier (col. 6, lines 41-43 and lines 59-60; where differential amplifier 104 comprises an amplified signal, thus comprising a power amplifier), where the first output transistor includes parasitic capacitance (col. 6, lines 53-55); and the second node of the differential winding operably coupled to a second output transistor

(T4) of a power amplifier (where the differential amplifier comprises power), where the first output transistor includes parasitic capacitance, where the first and second output transistors of the power amplifier provide loading of the differential signal (col. 6, lines 53-61).

Claim 6:

A RFIC comprising a receiver section operably coupled to convert inbound RF signals into inbound data; a transmitter section operably coupled to convert outbound data into outbound RF signals; and a tuned transformer balun circuit operably coupled to provide the inbound RF signals from an antenna to the receiver section and to provide the outbound RF signals to the antenna (Figs. 1 and 2) where the tuned transformer balun comprises a transformer balun having a single ended winding (pri) and a differential winding (sec), where the single-ended winding includes a first node (connected to 106) and a second node (connected to ground – Fig. 5) and the differential winding (sec) includes a first node (connected to C1), center node (connected to tap) and a second node (connected to C2 – Fig. 5); a first tuning capacitor (C1) having a first plate and a second plate (inherent, where the capacitor is inherently defined by opposing plates and where the plates are shown by the equivalent capacitor circuit representation), where the first plate of the first tuning capacitor is operably coupled to the first node of the differential winding and the second plate is operably coupled to ground (thru FET T3 and L3 connected to ground); a second tuning capacitor (C2) having a first plate and a second plate, where the first plate of the tuning capacitor is operably coupled to the second node of the differential winding and the

second plate is operably coupled to ground (thru FET T4 and L4 connected to ground); and a third tuning capacitor (C3 – Fig. 4) having a first plate and a second plate, where the first plate of the third tuning capacitor is operably coupled to the first node of the single-ended winding (pri) and the second plate is operably coupled to transceiver radio frequency signals (108), where based on loading of the single-ended winding and the differential winding, the first second and third tuning capacitors resonate with the transformer balun (where C1 and C2 block low frequency – col. 6, lines 36-39 and C3 is tuned – col. 6, line 67, discussed in the reasons for rejection of claim 1 above).

Claim 7:

A decoupling capacitor (C5) having a first plate and second plate, where the first plate of the decoupling capacitor is operably coupled to the second node of the single-ended winding and to the center node of the differential winding (shown in Fig. 4 where C5 connects to the end of the pri winding opposite the input and to the tap of the sec winding) and the second plate of the decoupling capacitor is operably coupled to circuit ground (thru L and R to ground) to provide low impedance AC ground connection over a range of frequencies (col. 7, lines 19-29, discussed in the reasons for rejection of claim 2 above).

Claim 8:

The transformer balun residing on at least one layer of an integrated circuit (on chip balun – col. 2, lines 8-43), where the second node of the single-ended winding is operably coupled to an integrated circuit pin via a bond wire (120; col. 7, lines 19-29) and where the integrated circuit pin is coupled to an antenna (108), where the bond wire

and antenna provide the loading of the single-ended winding (discussed in the reasons for rejection of claim 3 above).

Claim 9:

The first node of the differential winding operably coupled to a first output transistor (T3) of a power amplifier (col. 6, lines 41-43 and lines 59-60; where differential amplifier 104 comprises an amplified signal, thus comprising a power amplifier), where the first output transistor includes parasitic capacitance (col. 6, lines 53-55); and the second node of the differential winding operably coupled to a second output transistor (T4) of a power amplifier (where the differential amplifier comprises power), where the first output transistor includes parasitic capacitance, where the first and second output transistors of the power amplifier provide loading of the differential signal (col. 6, lines 53-61, discussed in the reasons for rejection of claim 4 above).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 6 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dabrowski in view of Dexter (U.S. Patent No. 6,654,595).

Claim 6:

Dabrowski teaches the tuned transformer balun, discussed in the reasons for rejection of claim 1 above, but shows only the balun component and does not show

associated circuitry such as a receiver section operably coupled to convert inbound RF signals into inbound data; a transmitter section operably coupled to convert outbound data into outbound RF signals.

Dexter shows an RFIC circuit comprising a similar single input and differential output balun (684) connected to FETs (671 – Fig. 4) and further comprising a receiver section operably coupled to convert inbound RF signals into inbound data; a transmitter section operably coupled to convert outbound data into outbound RF signals (Fig. 25-28).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the balun disclosed by Dabrowski in the circuit disclosed by Dexter. Such a modification would have realized the advantageous benefit of (changing the operating frequency of the balun by changing the values of the discrete capacitors – Dabrowski); further where the system of Dexter is drawn to frequencies in VHF and UHF spectrums and where Dexter explicitly recites where modifications may be made where the bandwidth may be increased from several hundred Megahertz to tens of Gigahertz (Dexter; col. 17, lines 20-24), where the balun of Dabrowski addresses frequencies of 100 to more than 2.5GHz (Dabrowski; col. 5, lines 5-14), thus suggesting the obviousness of the substitution.

Claim 10:

Where the first, second and third capacitors have a capacitance in the range of tens of picofarads (Dexter – table 2).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dean O. Takaoka whose telephone number is (571) 272-1772. The examiner can normally be reached on 8:30a - 5:00p Mon - Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on (571) 272-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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July 5, 2005